REMARKS

Responsive to the outstanding Office Action, the applicant has carefully studied the references cited by the Examiner and the Examiner's comments relative thereto. Favorable reconsideration of this application is respectfully requested in light of the following detailed discussion.

The Examiner rejected claims 1, 3-13, 17, 18 and 20 under 35 U.S.C. §103 as being unpatentable over Glaser in view of Keskar. Claims 14-16 are rejected under 35 U.S.C. §103 as being unpatentable over Glaser in view of Keskar and further in view of Arbab et al.

Glaser discloses a coated substrate for use in a low emissivity stack, or solar glazing, which comprises a transparent substrate, a lower coating on the transparent substrate, a functional layer on the lower coating, and an upper coating on the functional layer. The lower coating has a first layer comprising silicon or a metal, and nitrogen or oxygen, and a second layer comprising zinc oxide and having a thickness of at least 16 nm. The second layer is in contact with the functional layer. Glazer in no way suggests the use of an oxygen scavenger, and in fact, in example 1, discloses the formation of oxide layers in, an oxygen atmosphere.

Keskar et al. discloses a method for maintaining the temperature of an oxygen selective ion transport membrane within a desired temperature range. Keskar has nothing to do with the formation of reflective metal layers on a substrate, instead dealing with ion transport. The material used as an "oxygen scavenger" in Keskar, in fact, is merely used to reduce partial pressure on the anode (column 1, line 43) by driving oxygen away from the anode. This is not an oxygen scavenger as the term is used in the present invention.

The present invention, as described in amended independent claim 1, describes a process for the production of a coated substrate. The process comprises depositing a reflective metal layer onto a substrate by a low pressure deposition process performed in a coating atmosphere. It is important to note that the coating atmosphere contains a gaseous oxygen scavenger other than hydrogen.

The claims of this application are directed to a process for the production of a coated substrate which is carried out by low pressure deposition in the presence of an oxygen scavenger. These processes are carried out in an inert atmosphere. However the contamination of that atmosphere may have an adverse effect upon the properties of the coating. Applicant's invention is the introduction of a scavenger which mitigates these effects.

With regard to the rejection of claims 1, 3 -13, 17, 18 and 20 under 35 USC §103, in paragraph 5, the Examiner states that "Glaser discloses a multilayer stack produced by sputtering comprising bismuth oxide with silver deposited thereon over a glass substrate". In Applicant's view, it is important to recognize that Glaser teaches "a new type of stack" (column 2 line 40) which "may be prepared by a process of sputtering" (column 2 line 59). At column 6 line 20 Glaser states that "Fundamentally the process by which the multilayer stack is produced does not play any role in determining the optical properties of the multilayer system". Applicant asserts that Glazer says nothing about the process for producing his novel coating stack other than that it can be produced by sputtering. There is no incentive in Glazer to modify the sputtering process.

The Examiner points out that Glaser does teach a process in which "the sputtering of the metallic silver layer takes place in an argon atmosphere with the addition of 5% by volume of

hydrogen" (column 6 line 48). In his reply to Applicant's earlier comments, the Examiner states (paragraph 32) that whilst it is not necessarily stated that it (hydrogen) is an oxygen scavenger the fact remains that it is an oxygen scavenger". Applicant submits that this is a misrepresentation of the teaching of Glaser. Glaser sputters the silver in an atmosphere comprising argon and hydrogen. There is no teaching that the hydrogen functions as an oxygen scavenger and no justification for the idea that it is as a matter of fact an oxygen scavenger. As Glaser is completely silent about the sensitivity of his processes to the presence of oxygen, it is respectfully submitted that it cannot be understood that the hydrogen is taught to be an oxygen scavenger. As this is an obviousness type rejection, it is respectfully submitted that it would not be obvious to use an oxygen scavenger when this is not taught in Glaser.

In paragraph 7 of the outstanding Office Action, the Examiner states that Keskar discloses that hydrogen and methane are interchangeable oxygen scavenger gases. Applicant submits, however, that one skilled in the art of making coated metal glass as taught in the present invention would not look to Keskar as a reference in this field. Applicant submits that there is no reason whatever why one skilled in the art, who wished to deposit a multilayer coating stack using magnetron sputtering, would regard Keskar as being of any relevance whatever.

Keskar deals with the flow of oxygen across an ion transport reactor. Such reactors operate at a pressure of between 1 to 100 atmospheres (column 9 line 16) and elevated temperatures (450°C to 1200°C - column 5, line 1). Keskar's aim is to provide a chemical potential across the membrane by reducing the partial pressure of oxygen on the anode side.

Keskar teaches that natural gas, methane, ethanol, hydrogen or carbon monoxide can all be reacted with oxygen so as to reduce the partial pressure of the oxygen.

Applicant further submits that this teaching of Keskar is not relevant to sputtering processes which are carried out under high vacuum and which are useful even in the absence of any detectable quantity of oxygen. Keskar teaches the utility of a number of gases which at high temperature and pressure can react with oxygen and thereby reduce the concentration of oxygen in a gas stream. The fact that they are termed "scavengers" in Keskars process does not teach that they are "scavengers" in the sense used in the present application.

The Applicant further disagrees that one skilled in the art would be motivated to combine the applied references. In paragraph 8, the Examiner alleges that it is obvious to modify the invention of Glaser to utilize methane rather than hydrogen. This allegation is not justified. Glaser says absolutely nothing about why he introduces hydrogen into the atmosphere in which the silver layer is sputtered. Applicant submits that there is no incentive to modify this feature of Glaser's disclosure. As Glaser does not indicate any function for the hydrogen, it is not obvious for one skilled in the art to utilize, for example, methane. Relying on Keskar as disclosing alternative oxygen scavenging gases is not justified because it requires hindsight analysis of the present invention.

Applicant would like to point out to the Examiner the examples in the specification which illustrate the present invention. Comparative Example A (Table 2) is a conventional deposition process. It is carried out in the absence of oxygen and the resulting coating has a relatively low sheet resistance. Comparative Example B illustrates the problem which is addressed by the

present invention. In the presence of oxygen the conventional process produces a layer having a high sheet resistance. Applicants point out that Glaser does not suggest the existence of this problem, and would therefore not be motivated to address it.

While the Arbad reference is applied against only dependent claims, the applicant would like to also argue against its applicability. The Examples of the invention reported as Table 1 show the benefit of the invention. Example 1 which is carried out under conditions strictly comparable with Examples A and B results in a thinner coating having a sheet resistance higher than A but lower than B. Example 2 uses a slower glass traverse speed to deposit a thicker layer which has a sheet resistance which is comparable to A and lower than B.

It is this improvement rather than the absolute value of the sheet resistance which characterises the invention. This is why Applicants submit that the third reference USP 6398925 (Arbad) relied on by the Examiner is not relevant to their invention. Arbad merely recites known values for sheet resistance. Applicant's invention indicates how to achieve these desired values under real life conditions.

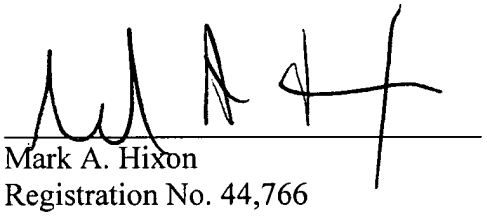
The examiner newly raises a double patenting objection based upon earlier patent US 6,540,884. It is respectfully submitted that this allegation is unjustified. The claims of '884 require that a metal oxide layer is deposited above a reflective metal layer in the presence of methane as an oxygen scavenger. Claim 1 of the present application is directed to process for the deposition of a reflective metal layer in the presence of an oxygen scavenger. Thus, it is respectfully submitted that the process of the present invention is not unpatentable over the metal oxide layer deposited above a reflective metal layer in the presence of methane as an oxygen

scavenger, which was claimed in the referenced patent. Thus, it is respectfully requested that the double patenting rejection be withdrawn.

In view of the above, it is respectfully submitted that independent claim 1 is not rendered obvious or unpatentable by any reasonable combination of Keskar et al. and Glaser et al. Claims 3-18 and 20 are believed to be allowable at least because of their dependence, directly or indirectly, on what are believed to be an allowable base claim.

In view of the above amendments and remarks, a favorable reconsideration of the present application and the passing of this application to issue with all claims allowed are courteously solicited.

Respectfully submitted,



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